1. Amendments to the Claims:

A clean version of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121(c)(3). This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) An image data processing method of automatic adaptation of 3-D surface Model to image features, for Model-based image segmentation, the method comprising:

creating a deformable tubular mesh model for fitting a 3-D path ~~composed of~~ comprising a set of ordered points defining a plurality of path segments, the mesh model comprising a plurality of mesh segments corresponding to the plurality of path segments; and

automatically adapting ~~the~~ a mesh radius of each path segment based on ~~the~~ a curvature of the ~~3-D~~ corresponding path segment, ~~and sample~~ a distance ~~of the path~~ between the ordered points defining the corresponding path segment, and a predefined input radius.

2. (Currently amended) The image processing method of claim 1, ~~of~~ wherein creating the deformable tubular mesh model ~~with 2-simplex meshes or triangular meshes or any other kind of meshes, having~~ comprises:

creating a tubular structure for fitting ~~a~~ the 3-D path, which ~~is the~~ substantially comprises a centerline of a 3-D tubular object of interest ~~that may present all kinds of curvatures,~~; and ~~of~~

mapping the 3-D deformable tubular ~~mesh model~~ structure onto ~~the~~ a 3-D surface of the tubular object of interest, which is represented in a gray level 3-D image.

3. (Currently amended) The image processing method of claim 1, further comprising:

computing a 3-D path that corresponds to ~~the~~ a centerline of a tubular object of interest ~~to segment~~ and defining the path segments on ~~said~~ the 3-D path;

creating an initial straight deformable cylindrical mesh model, of any kind of mesh, ~~with~~ having a length ~~defined~~ along ~~its~~ a longitudinal axis equal to ~~the~~ a length of the 3-D path;

dividing ~~this~~ the initial mesh model into segments of length ~~related~~ corresponding to the ~~different~~ path segments of the 3-D path; and

computing, for each mesh segment of the initial mesh model, a rigid-body transformation that transforms ~~the~~ an initial direction of the mesh segment into ~~the~~ a direction of the ~~related~~ corresponding path segment of the 3-D path, and applying ~~this~~ the transformation to ~~the~~ corresponding vertices of the mesh ~~corresponding to that~~ segment.

4. (Currently amended) The image processing method of claim 3, further comprising:

~~computing~~ blending the rigid-body transformations ~~related to the successive segments, which transformations, are blended in between two~~ of consecutive mesh segments.

5. (Currently amended) The image processing method of claim 4, ~~for limiting self-intersections between bent parts of the mesh model,~~ further comprising:

computing rotations for the rigid-body transformations ~~between~~ of consecutive mesh segments,

wherein a linear interpolation is used between ~~two~~ rotations of the consecutive mesh segments for blending the 3-D rigid body ~~transformation blending~~ transformations to limit self-intersections between bent portions of the deformable tubular mesh model.

6. (Currently amended) The image processing method of claim 1, ~~for avoiding self-intersections in the bent regions of the tubular deformable mesh model together with sharp radius changes from one segment of the mesh model to the other comprising~~, wherein automatically adapting ~~the~~ a mesh radius comprises:

modulating the radius of the ~~cylindrical~~ deformable tubular mesh model according to ~~the~~ a local curvature of the 3-D path to limit self-intersections between bent portions of the

deformable tubular mesh model.

7. (Currently amended) The image processing method of claim 6, further comprising:

approximating the local curvature[[,]]; and

applying ~~the~~ a radius modulation technique ~~chosen among~~ comprising one of linear blending or bi-cubic spline interpolation from one radius to ~~the other~~ another.

8. (Currently amended) The image processing method of claim 1, ~~for minimizing Mesh Torsion,~~ further comprising:

~~computing the~~ determining a 3-D rotation comprising computing a minimal 3-D rotation from ~~the~~ an initial mesh direction to a target segment to minimize mesh torsion.

9. (Currently amended) The image processing method of claim 8, ~~comprising~~ wherein determining the 3-D rotation further comprises:

defining rotation between segments ~~with~~ using an axis parameter and ~~with~~ a rotation angle parameter; and

computing ~~these~~ the parameters iteratively ~~from one segment to the other~~ between adjacent segments so that ~~the~~ a new rotation for a current segment ~~is computed as~~ comprises a composition of ~~the~~ a found rotation for ~~the~~ a previous segment and the minimal rotation from the previous ~~and~~ segment to the current segment.

10. (Currently amended) A medical viewing system comprising:

means for acquiring 3-D medical image data of a 3-D object of interest having substantially tubular parts[[,]];

a suitably programmed computer or a special purpose processor having circuit means~~,~~ ~~which are~~ arranged to process ~~these~~ the image data according to the method as claimed in claim 1; and

display means to display the medical images.

11. (Currently amended) A medical examination apparatus ~~having~~ comprising:

~~Means~~ means to acquire a three-dimensional image of an organ of a body, the organ having substantially tubular parts; and

a medical viewing system according to claim 10.

12. (Canceled)

13. (New) The image processing method of claim 2, wherein the deformable tubular model is created with one of 2-simplex meshes or triangular meshes.

14. (New) A method of automatically adapting a three-dimensional surface model of a substantially tubular object, the method comprising:

determining a three-dimensional path corresponding to a centerline of the tubular object;

defining a plurality of path segments on the three-dimensional path;

creating an initial straight deformable cylindrical mesh model having a length equal to a length of the three-dimensional path;

dividing the initial mesh model into a plurality of mesh segments corresponding to the plurality path segments;

computing a rigid-body transformation for each mesh segment for transforming an initial direction of each mesh segment into a path direction of the corresponding path segment;

applying the rigid-body transformation for each mesh segment to corresponding vertices of the mesh segment; and

adapting a mesh radius of each mesh segment based on at least a curvature and a length of the corresponding path segment.

15. (New) The method of claim 14, further comprising:

performing linear blending on the rigid-body transformations of consecutive mesh segments.

16. (New) The method of claim 14, wherein adapting the mesh radius of each mesh segment comprises reducing a diameter of the deformable cylindrical mesh model in highly curved portions of the three-dimensional path.

17. (New) A computer readable medium for storing a computer program executable to process data for automatic adaptation of a three-dimensional surface model to image features, the computer readable medium comprising:

a mesh model code segment for creating a deformable tubular mesh model for fitting a three-dimensional path comprising a set of ordered points defining a plurality of path segments, the mesh model comprising a plurality of mesh segments corresponding to the plurality of path segments; and

a radius adapting code segment for automatically adapting a mesh radius of each path segment based on a curvature of the corresponding path segment, a distance between the ordered points defining the corresponding path segment, and a predefined input radius.